TOSHIBA

Leading Innovation

AIR CONDITIONER (SPLIT TYPE)
Installation Manual

HFC
R410A

Indoor Unit

Model name:

Slim Duct Type

RAV-SM404SDT-E
RAV-SM454SDT-E
RAV-SM564SDT-E

Not accessible to the general public
Vente interdite au grand public
Kein öffentlicher Zugang
Non accessibile a clienti generici
No destinado al público en general

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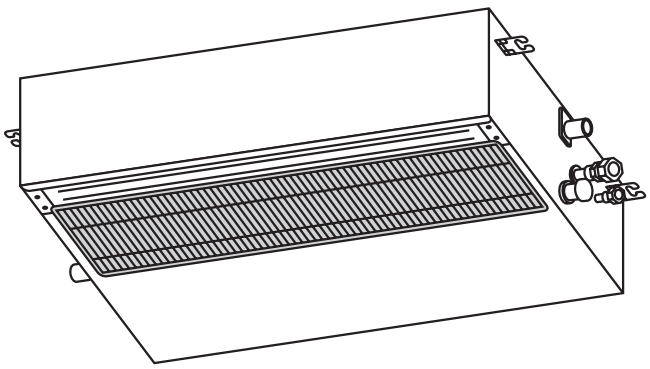

MB FRIGO Grupa d.o.o., Bani 81, 10010 Zagreb, www.toshiba.hr, e-mail: toshiba@mbfrigo.hr

Thank you very much for purchasing TOSHIBA Air Conditioner.
Please read this Installation Manual carefully before installing the Air Conditioner.
- This Manual describes the installation method of the indoor unit.
- For installation of the outdoor unit, follow the Installation Manual attached to the outdoor unit.

ADOPTION OF NEW REFRIGERANT

This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

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1 ACCESSORY PARTS

■ Accessory parts

Part name	Q'ty	Shape	Usage
Installation Manual	2	These manual	(Be sure to hand over to customers)
Insulating pipe	2		For insulation pipe connecting section
Washer	8	M10 × Ø34	For hanging-down unit
Hose band	1		For connecting drain pipe
Flexible hose	1		For adjusting of drain pipe centering
Heat insulator	1		For insulating drain connecting section
Owner's Manual	1		(Be sure to hand over to customers)

2 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety.
  Observe them without fail.
- After the installation work, perform a trial operation (test run) to check for any problem.
  Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install (including moving)/ maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Be sure to connect earth wire. (grounding work)**
  Incomplete grounding cause an electric shock.
  Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Install the refrigerant pipe securely during the installation work before operating the air conditioner.**
  If the air conditioner is operated with the valve open and without the refrigerant pipe, the compressor sucks air and the refrigeration cycle is overpressurized, which may cause a burst or injury.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it resultingly causes pipe burst and injuries on persons.
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.

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- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified wires for wiring connect the terminals securely fix.**
  To prevent external forces applied to the terminals from affecting the terminals.
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **For the refrigerant recovery work (collection of refrigerant from the pipe to the compressor), stop the compressor before disconnecting the refrigerant pipe.**
  If the refrigerant pipe is disconnected while the compressor is working with the valve open, the compressor sucks air and the refrigeration cycle is overpressurized, which may cause a burst or injury.

⚠ CAUTION

New Refrigerant Air Conditioner Installation

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**
- The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.
- To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are changed from those for the conventional refrigerant.
- Accordingly the exclusive tools are required for the new refrigerant (R410A).
- For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter.

To Disconnect the Appliance from Main Power Supply.

- This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.
- **The installation fuse must be used for the power supply line of this conditioner.**
- **Tighten the flare nut with a torque wrench in the specified manner.**
  Excessive tightening of the flare nut may cause a crack in the flare nut after a long period, which may result in refrigerant leakage.
- **Wear heavy gloves during the installation work to avoid injury.**

3 SELECTION OF INSTALLATION PLACE

⚠ WARNING

- **Install the air conditioner at enough strong place to withstand the weight of the unit.**
  If the strength is not enough, the unit may fall down resulting in injury.
- **Install the air conditioner at a height 2.5m or more from the floor.**
  If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

⚠ CAUTION

- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks and stays around the unit, a fire may occur.

Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.

- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring).
  (Should the unit be used in these places, special protective measures are needed.)
- A restaurant kitchen where a lot of oil is used or place near machines in a factory (Oil adhering to the heat exchanger and resin part (fan) in the indoor unit may reduce the performance, generate mist or dew drop, or deform or damage resin parts.)
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighbor house. (Outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
  (When install the outdoor unit on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation. (Before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)
- Do not use the air conditioner for special purposes such as preserving food, precision instruments, or art objects, or where breeding animals or growing plants are kept. (This may degrade the quality of preserved materials.)
- Place where any of high-frequency appliances (including inverter devices, private power generators, medical equipment, and communication equipment) and inverter-type fluorescent light is installed.
  (A malfunction of the air conditioner, abnormal control, or problems due to noise to such appliances/ equipment may occur.)
- When the wireless remote controller is used in a room equipped with an inverter-type fluorescent light or at a place exposed to direct sunlight, signals from the remote controller may not be received correctly.
- Place where organic solvent is used.
- Place where special spray is used frequently.

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■ Installation under high-humidity atmosphere

In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 23°C or higher).

1. Installation to inside of the ceiling with tiles on the roof
2. Installation to inside of the ceiling with slated roof
3. Installation to a place where inside of the ceiling is used for pathway to intake the fresh air

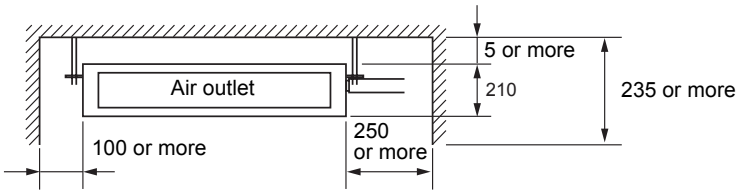
- In the above cases, additionally attach the heat insulator to all positions of the air conditioner, which come to contact with the high-humidity atmosphere. In this case, arrange the side plate (Check port) so that it is easily removed.
- Apply also a sufficient heat insulation to the duct and connecting part of the duct.

[Reference]	Dewing test conditions	
	Indoor side:	27°C dry bulb temperature 24°C wet bulb temperature
	Air volume:	Low air volume, operation time 4 hours

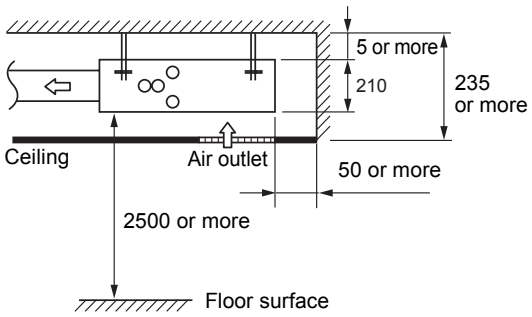
■ Installation space

(Unit:mm)

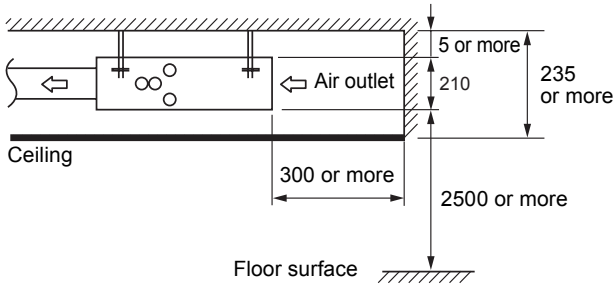
Reserve space required for maintenance the indoor unit and service work.



<Under air Inlet>

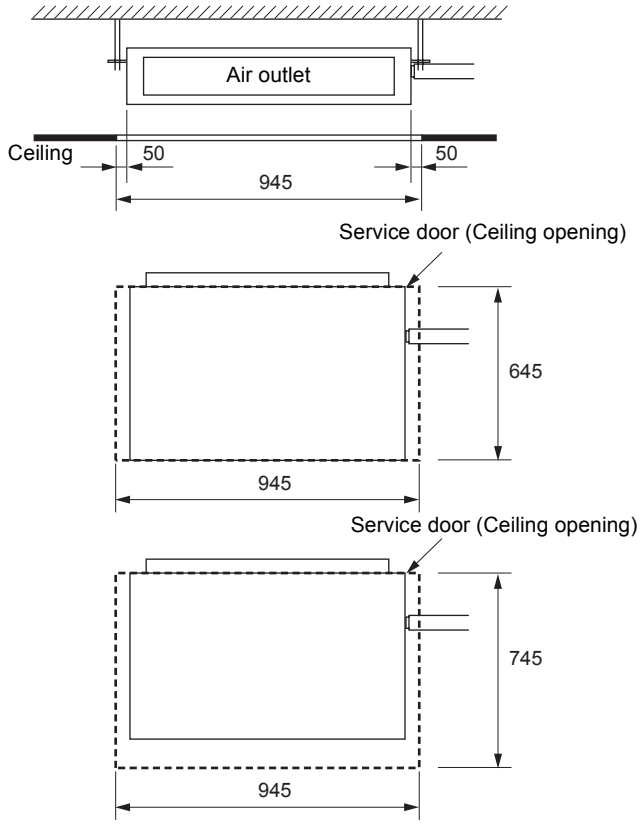


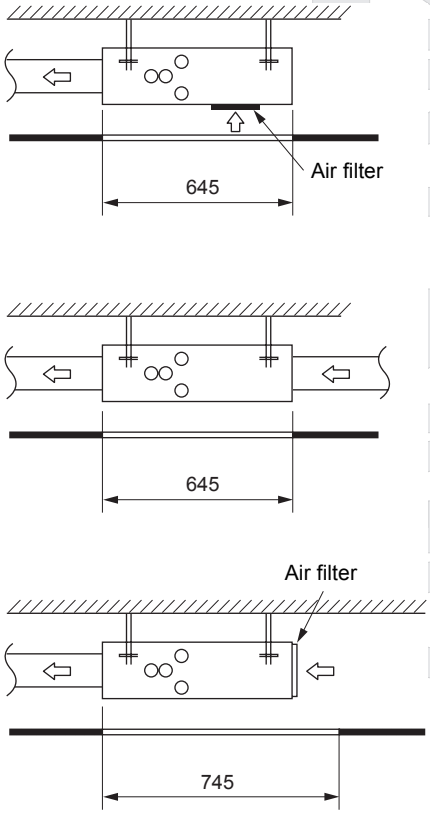
<Back air Inlet>



■ Service space

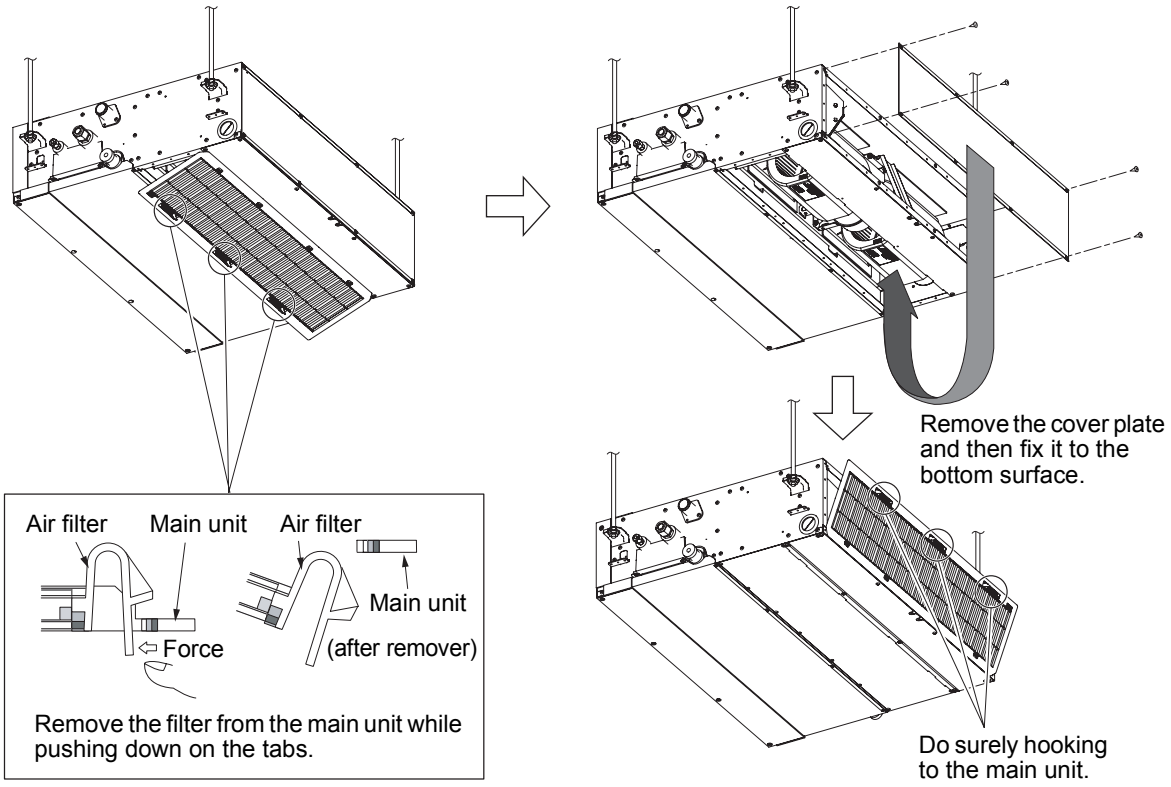
(Unit:mm)





■ Arranging the to back air inlet type

<Back air inlet>


Air filter
Main unit
Air filter
Main unit
(after remover)
Force
Remove the filter from the main unit while pushing down on the tabs.
Remove the cover plate and then fix it to the bottom surface.
Do surely hooking to the main unit.

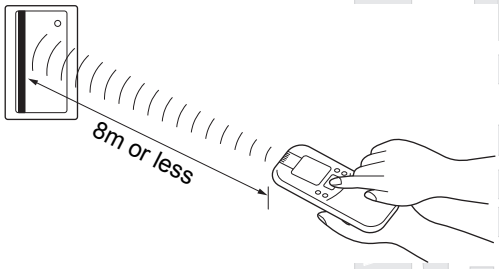
■ Notification of filter cleaning term setup

The lighting term setup of the filter sign (Notification of filter cleaning) of the remote controller can be changed according to the condition of installation.
For setup method, refer to “Change of lighting term of filter sign” and “To secure better effect of heating” in the Applicable controls of this Manual.

■ In case of wireless type

The sensor of indoor unit with wireless remote controller can receive a signal 8m or less.
Based upon it, determine a place where the remote controller is operated and the installation place of the indoor unit.

- To prevent a malfunction, select a place where is not influenced by a florescent light or direct sunlight.
- Two or more (Up to 6 units) indoor units with wireless remote controller can be installed in the same room.



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4 INSTALLATION

⚠ WARNING

- Install the air conditioner certainly to sufficiently withstand the weight.
- If the strength is insufficient, the unit may fall down resulting in human injury.
- Perform a specified installation work to guard against strong wind or earthquake.
- An incomplete installation can cause accidents by the units falling and dropping.

REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- To move the indoor unit, hold the hooking metals (4 positions) only.
  Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not bundle it with plastic band at positions other than specified.

■ External view

(Unit:mm)

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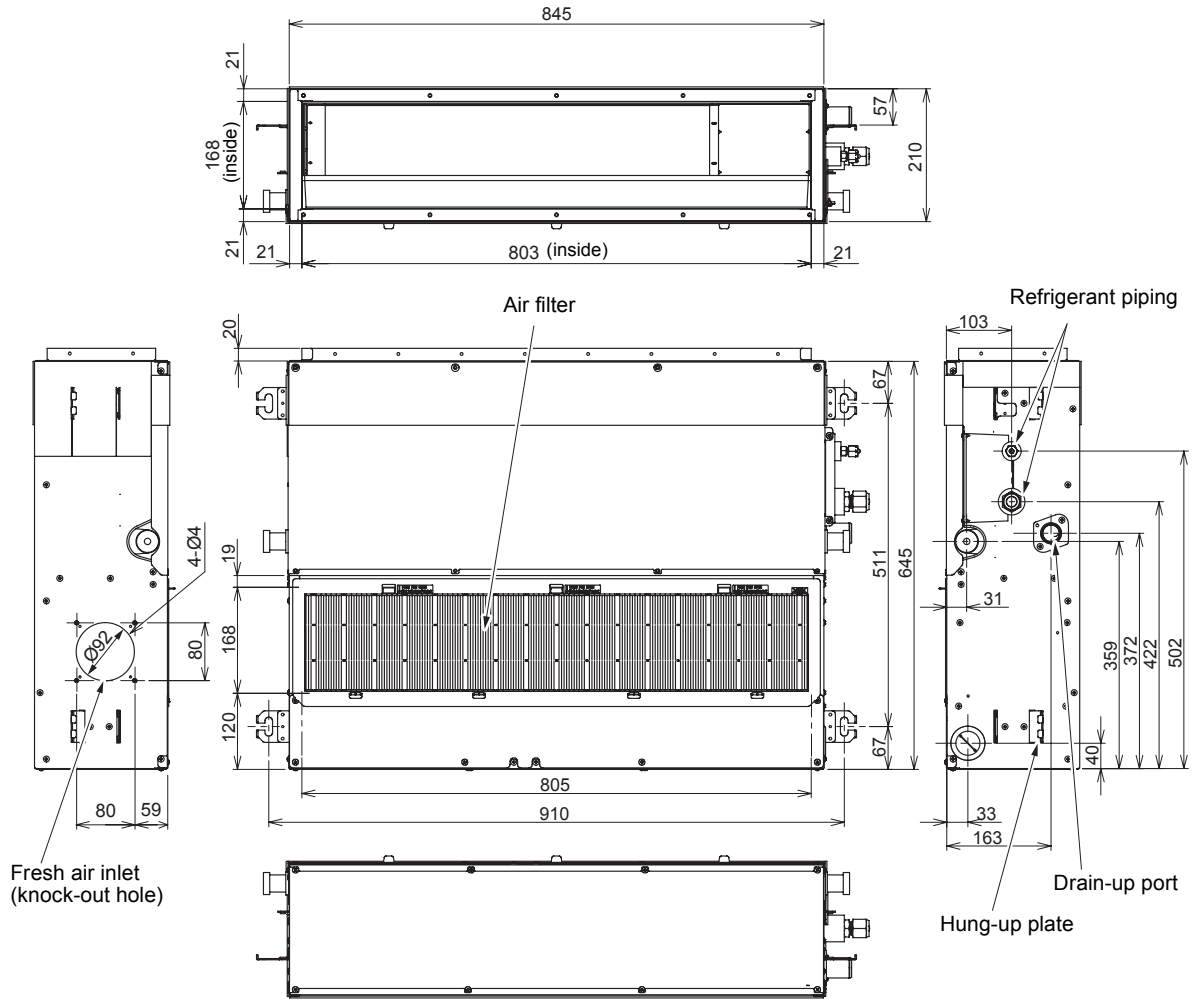


■ Opening hole on ceiling and placing of hanging bolt

- Considering the indoor unit and the hanged-up piping/wiring work, determine the installation position and direction.
- After installation position of the indoor unit has been determined, open a hole on the wiring and place the hanging bolt.
- For opening size of the ceiling and the hanging bolt pitch, see the external view.
- When the ceiling has already boarded, draw the drain pipe, refrigerant pipe, inter-unit wire between indoor and outdoor units, central control system wire, and remote controller wire up to the position where pipes and wires are connected before hanged-up the indoor unit.

The hanging bolts and nuts will be procured locally.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

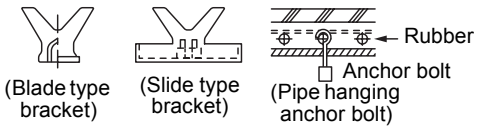
Installation of hanging bolt

Use M10 hanging bolts (4 pcs, to be local procure).

Matching to the existing structure, set pitch according to size in the unit external view as shown below.

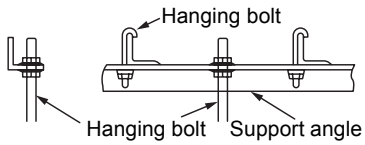
New concrete slab

Install the bolts with insert brackets or anchor bolts.



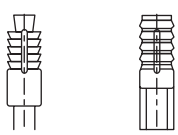
Steel flame structure

Use existing angles or install new support angles.



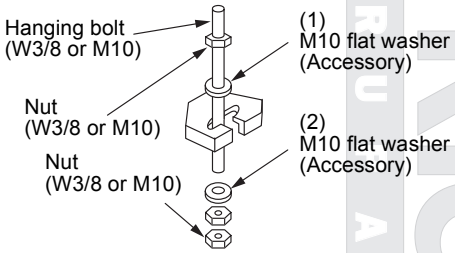
Existing concrete slab

Use a hole-in anchors, hole-in plugs, or a hole-in bolts.



■ Installation of indoor unit

- Attach the nuts (M10 or W3/8: Procured locally) and the attached washers (Ø34) to the hanging bolt.
- Put washers at up and down of T-groove of the hanging bracket of the indoor unit to hang down the indoor unit.
- Using a level vial, check that four sides are horizontal. (Horizontal degree: Within 5mm)



(1) Required those other than M10 flat washer at site.
(2) To prevent falling-off of bolt (safety), be sure to set it just under the hanging bracket as shown in the figure. (910mm × 511mm)

5 DRAIN PIPING WORK

⚠ CAUTION

- **Following the Installation Manual, perform the drain piping work so that water is properly drained, and apply a heat insulation so as not to cause a dew droping. Inappropriate piping work may result in water leakage in the room and wet of furniture.**

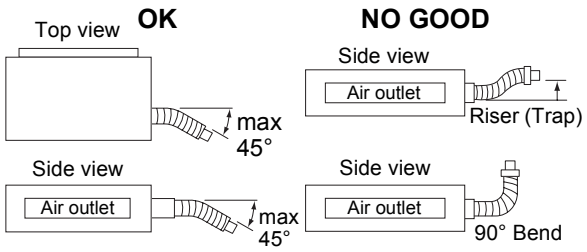
■ Pipe material/Insulator and size

The following materials for piping work and insulating process are procured locally.

Pipe material	Hard vinyl chloride pipe socket for VP25
	Hard vinyl chloride pipe VP25 (Nominal outer diameter Ø32mm)
Insulator	Foamed polyethylene foam, thickness: 10mm or more

■ Connection of flexible hose

- Insert the soft socket of the attached flexible hose into the connecting port of the drain pipe until it strikes against the end.
- Align the attached hose band to the end of the pipe connecting port, and then tighten it surely.

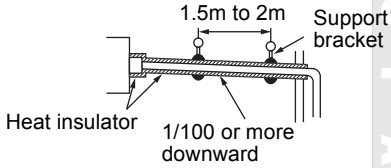


REQUIREMENT

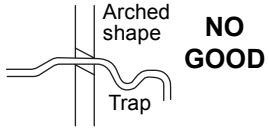
- Be sure to fix the soft socket with the attached hose band and set the tightening position at upper side.
- Use the attached flexible hose by bending it with 45° or less so that no breakage or clogging occurs.

REQUIREMENT

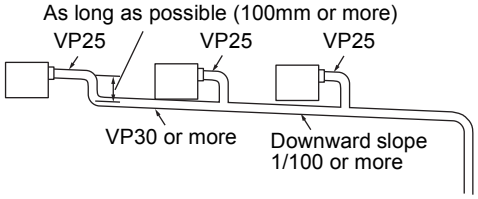
- Be sure to perform heat insulation of the drain pipes of the indoor unit.
- Never forget to perform heat insulation of the connecting part with the indoor unit.
  An incomplete heat insulation causes dew droping.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.



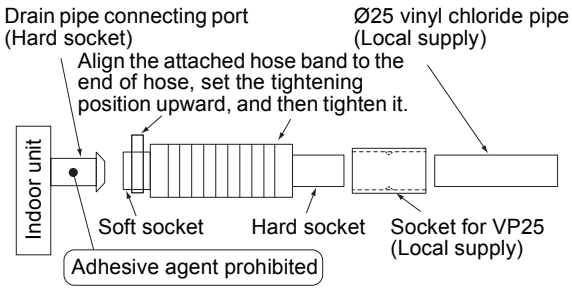
- For length of the traversing drain pipe, restrict to 20m or less.
  In case of a long pipe, provide support brackets with interval of 1.5 to 2m in order to prevent waving.



- Set the collective piping as shown in the below figure.



- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit.
  For connection with the drain pipe connecting port, be sure to fix the attached flexible hose.


Drain pipe connecting port (Hard socket)
Ø25 vinyl chloride pipe (Local supply)
Align the attached hose band to the end of hose, set the tightening position upward, and then tighten it.
Indoor unit
Soft socket
Hard socket
Socket for VP25 (Local supply)
Adhesive agent prohibited

- Adhesive agent cannot be used for the pipe connecting port (hard socket) of the indoor unit.
  Be sure to use the attached hose band for fixing, otherwise damage or water leakage of the drain pipe connecting port is caused.

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■ Connection of drain pipe

- Connect the hard socket (local supply) to the hard socket side of the attached flexible hose which has been installed.
- Connect the drain pipes (local supply) successively to the connected the hard socket.

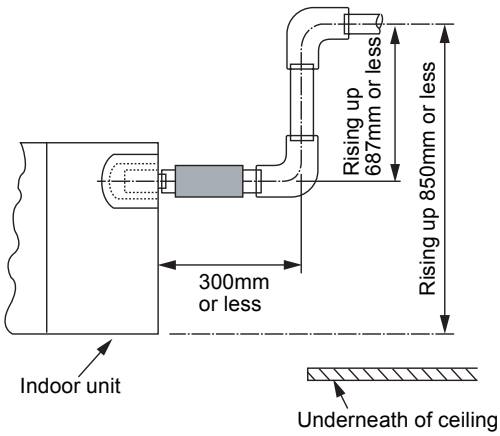
REQUIREMENT

- Using adhesive agent for vinyl chloride, connect the hard vinyl chloride pipes certainly so that water does not leak.
- It requires several times to dry and harden the adhesive agent.
  (Refer to Guide Manual of the adhesive agent.)
  In this time, be sure not to apply force to the connecting section with the drain pipes.

■ Drain up

When a downward grading cannot be secured on the drain pipe, a drain-up work is possible.

- Set the height of the drain pipe within 850mm from the bottom surface of the indoor unit.
- Draw out the drain pipe within 300mm from the end of the drain pipe connecting port of the indoor unit, and then raise it vertically.
- After the drain pipe has been raised, set a grading so that it is immediately bent downward.



■ Check the draining

After drain piping work, check that water drain is properly performed and water does not leak from the connecting part of the pipes. In this time, check also there is no abnormal sound of the motor of the drain pump. Be sure to check draining when installed in the heating period.

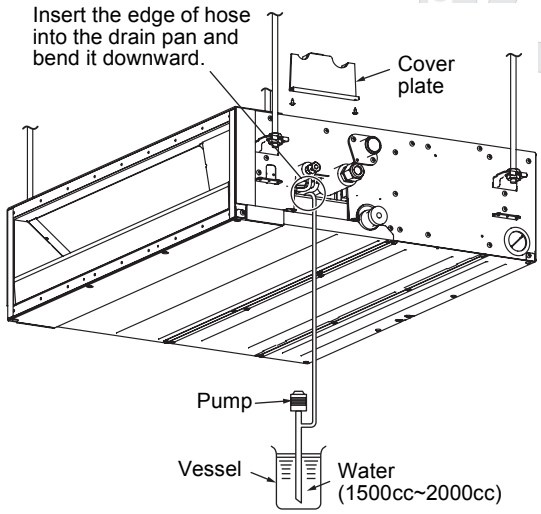
When the electric work has finished:

- Pour water as shown in the following figure, check water is drained from the drain pipe connecting port in COOL mode, and then check there is no water leak from the drain pipes.

⚠ CAUTION

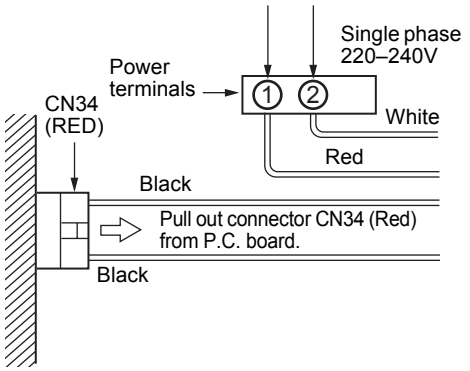
Pour water slowly.

If it is poured urgently, water is spread inside of the indoor unit resulted in a trouble.



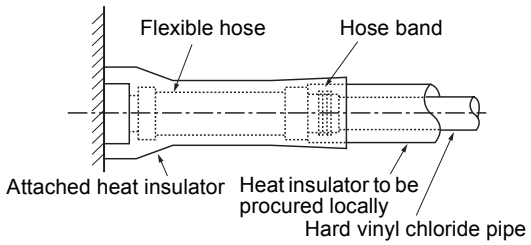
- If the electric work has not yet finished, pull out the float switch connector (CN34 : Red) from the electric parts box, and check draining by plugging the single phase 220–240V power to the terminal blocks ① and ②.
  If doing so, the drain pump motor operates.
- Test water drain while checking the operation sound of the drain pump motor.
  (If the operation sound changes from continuous sound to intermittent sound, water is normally drained.)

- After the check, the drain pump motor runs, connecting the float switch connector.
  (In case of check by pulling out the float switch connector, be sure to return the connector to the original position.)



■ Heat insulating process

- After drain check, using the attached heat insulator for drain connecting section, wrap the flexible hose without clearance from the end of the drain pipe connecting port of the indoor unit.
- Covering the attached heat insulator for drain connecting section, wrap the drain pipe with heat insulator (local supply) without clearance.



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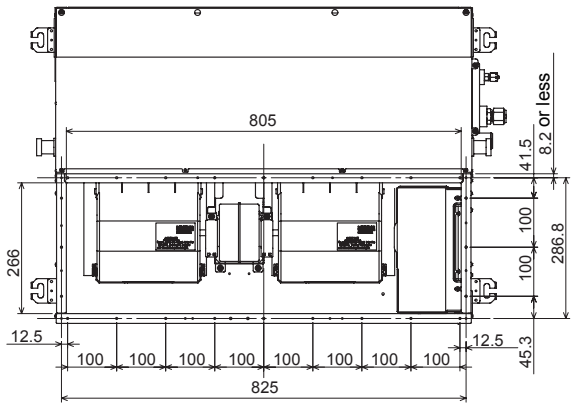
6 AIR DUCTING

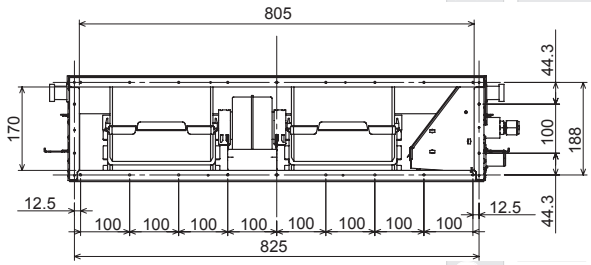
■ Arrangement

Referring to the following dimensions, manufacture duct at the local site.

<Under air inlet>

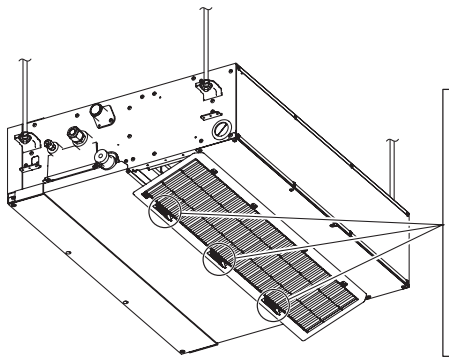


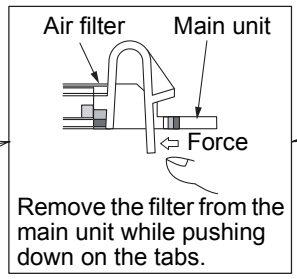
<Back air inlet>



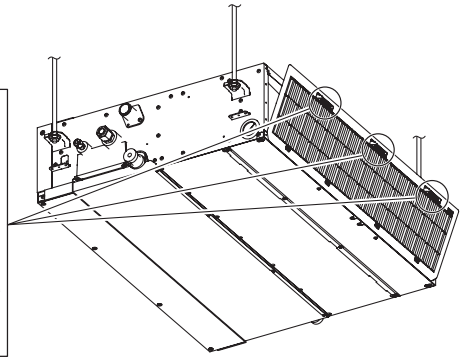
Be sure to mount an air filter to the air inlet side; otherwise decrease of capacity and etc. may be caused.

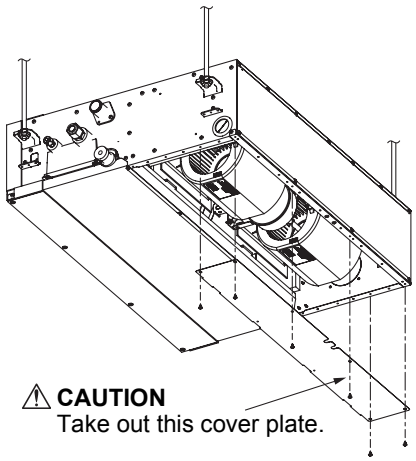
<Under air inlet>

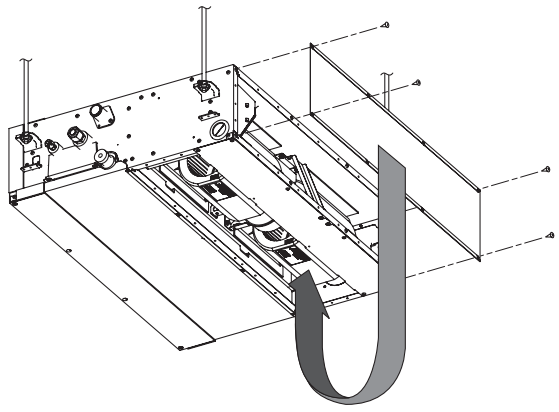




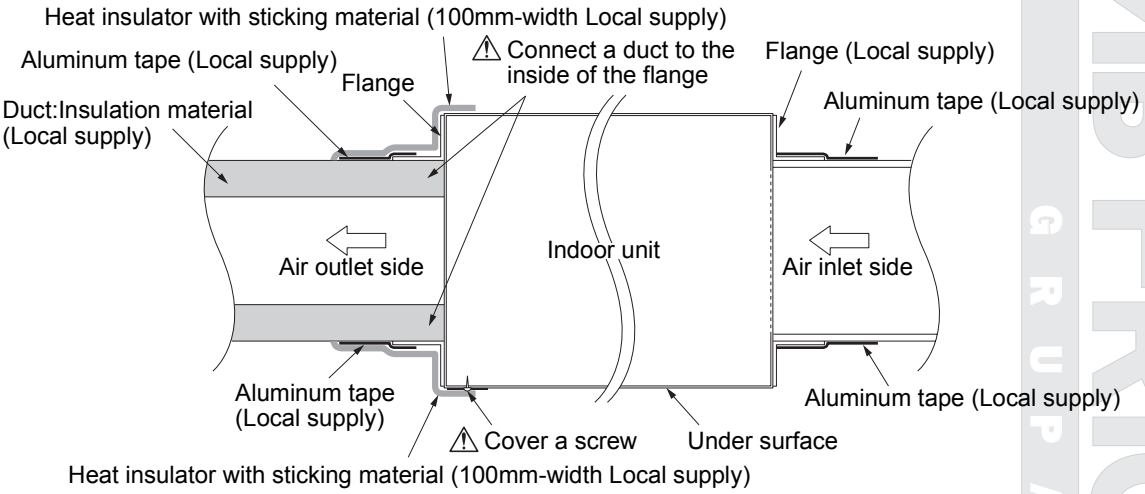
<Back air inlet>







■ Connecting method of the duct


Heat insulator with sticking material (100mm-width Local supply)
Aluminum tape (Local supply)
Flange
⚠ Connect a duct to the inside of the flange
Flange (Local supply)
Duct:Insulation material (Local supply)
Aluminum tape (Local supply)
Air outlet side
Indoor unit
Air inlet side
Aluminum tape (Local supply)
Aluminum tape (Local supply)
⚠ Cover a screw
Under surface
Heat insulator with sticking material (100mm-width Local supply)

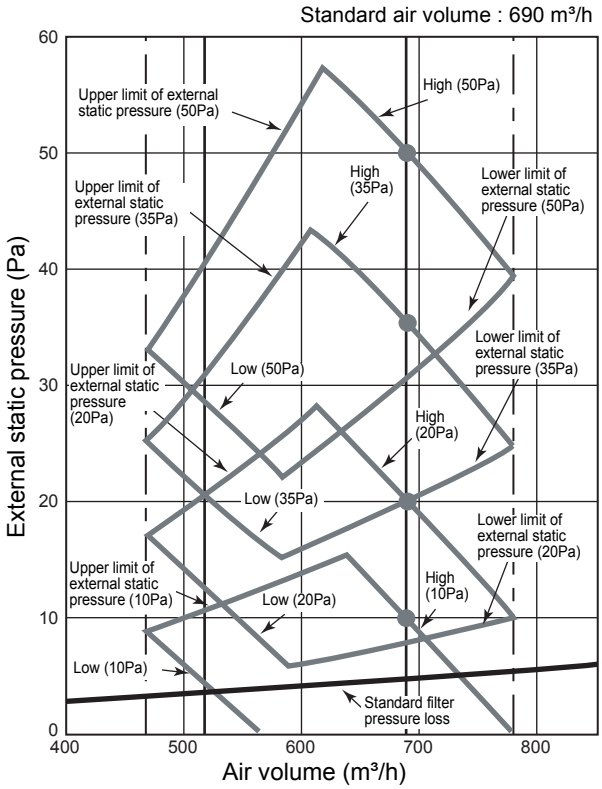
⚠ CAUTION

Incomplete heat insulation of the supply air flange and sealing may occur dewing resulted in falling of water drop.

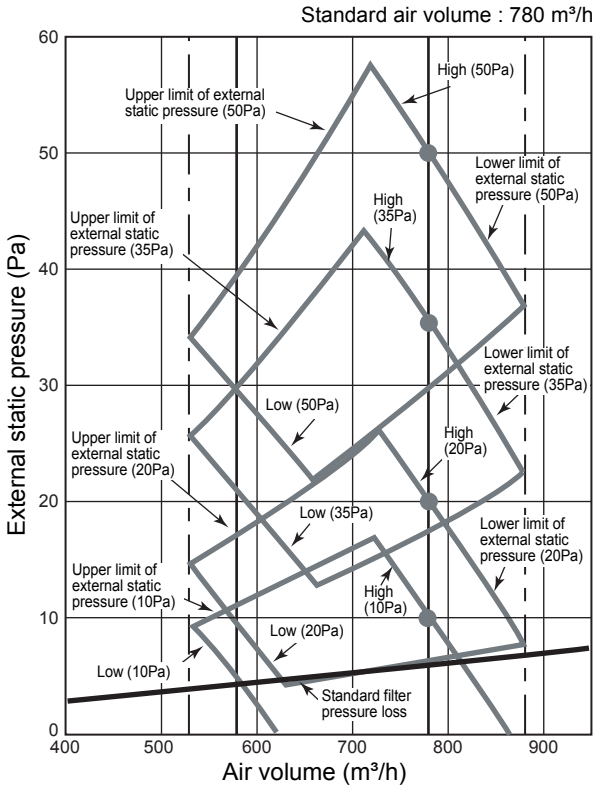
EN

■ Static presure characteristics

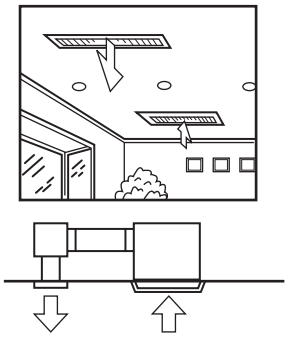
RAV-SM404SDT-E/454SDT-E

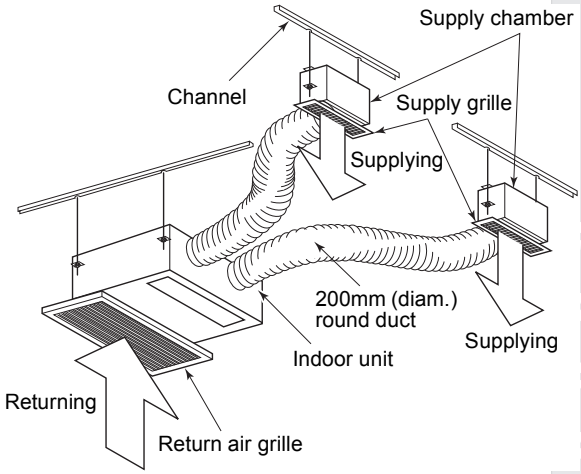

Standard air volume : 690 m³/h
External static pressure (Pa)
Air volume (m³/h)
Upper limit of external static pressure (50Pa)
High (50Pa)
Upper limit of external static pressure (35Pa)
High (35Pa)
Lower limit of external static pressure (50Pa)
Lower limit of external static pressure (35Pa)
Upper limit of external static pressure (20Pa)
Low (50Pa)
High (20Pa)
Low (35Pa)
Lower limit of external static pressure (20Pa)
Upper limit of external static pressure (10Pa)
Low (20Pa)
High (10Pa)
Low (10Pa)
Standard filter pressure loss

RAV-SM564SDT-E

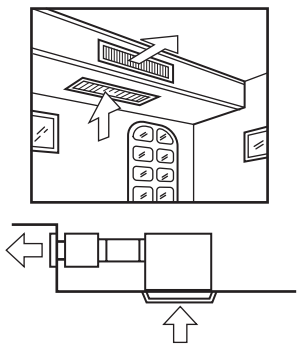

Standard air volume : 780 m³/h
External static pressure (Pa)
Air volume (m³/h)
Upper limit of external static pressure (50Pa)
High (50Pa)
Lower limit of external static pressure (50Pa)
Upper limit of external static pressure (35Pa)
High (35Pa)
Lower limit of external static pressure (35Pa)
Low (50Pa)
Upper limit of external static pressure (20Pa)
High (20Pa)
Low (35Pa)
Lower limit of external static pressure (20Pa)
Upper limit of external static pressure (10Pa)
High (10Pa)
Low (20Pa)
Low (10Pa)
Standard filter pressure loss

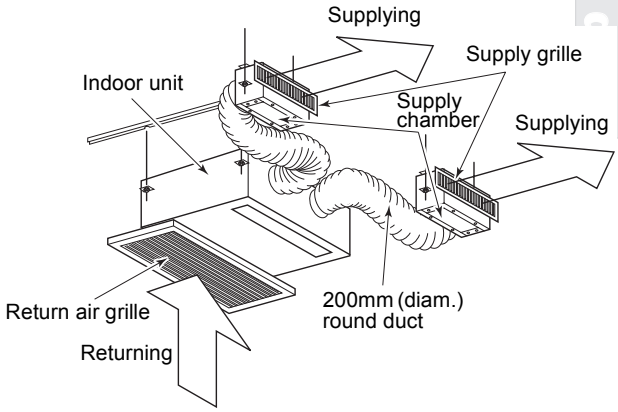
Concealed duct type





Ledge ceiling concealed duct type





7 REFRIGERANT PIPING AND EVACUATING

■ Refrigerant Piping

1. If the outdoor units are to be mounted on a wall, make sure that the supporting platform is sufficiently strong. The platform should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
2. **Use copper pipe with 0.8 mm or more thickness.**
3. Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

REQUIREMENT

When the refrigerant pipe is long, provide support brackets at intervals of 2.5 to 3m to clamp the refrigerant pipe. Otherwise, abnormal sound may be generated.

⚠ CAUTION

IMPORTANT 4 POINTS FOR PIPING WORK

1. Remove dust and moisture from the inside of the connecting pipes.
2. Tight connection (between pipes and unit)
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check the gas leakage. (Connected points)

■ Pipe size

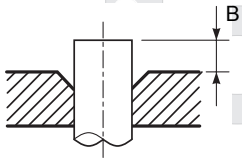
Model name	RAV-	SM404, 454, 564 type
Pipe size	Gas side	12.7 mm
	Liquid side	6.4 mm

■ Permissible Piping Length and Height Difference

They vary according to the outdoor unit.
For details, refer to the Installation Manual attached to the outdoor unit.

Flaring

- Cut the pipe with a pipe cutter. Remove burrs completely. Remaining burrs may cause gas leakage.
- Insert a flare nut into the pipe, and flare the pipe. As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended. However, the conventional tools can be used by adjusting projection margin of the copper pipe.



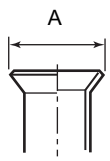
▼ Projection margin in flaring : B (Unit : mm)
Rigid (Clutch type)

Outer diam. of copper pipe	R410A tool used	Conventional tool used
	R410A	R410A
6.4	0 to 0.5	1.5 to 2.0
12.7		2.0 to 2.5

▼ Flaring diam. meter size : A (Unit : mm)

Outer diam. of copper pipe	$A^{+0}_{-0.4}$
	R410A
6.4	9.1
12.7	16.6

* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.



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Tightening connection

⚠ CAUTION

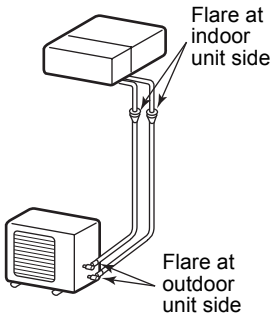
- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

(Unit : N•m)

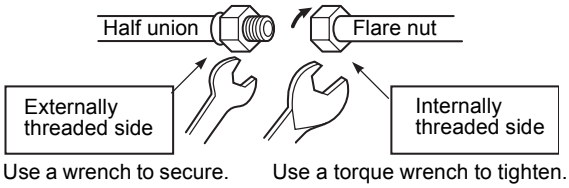
Outer diam. of copper pipe	Tightening torque
6.4 mm (diam.)	14 to 18 (1.4 to 1.8 kgf•m)
12.7 mm (diam.)	50 to 62 (5.0 to 6.2 kgf•m)

▼ Tightening torque of flare pipe connections

Pressure of R410A is higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.



Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.



REQUIREMENT

Tightening with an excessive torque may crack the nut depending on installation conditions. Tighten the nut within the specified tightening torque.

Piping with outdoor unit

- Shape of valve differs according to the outdoor unit.
  For details of installation, refer to the Installation Manual of the outdoor unit.

■ Air purge

Using a vacuum pump, perform vacuuming from the charge port of valve of the outdoor unit.
For details, follow to the Installation Manual attached to the outdoor unit.

- Never use the refrigerant sealed in the outdoor unit for air purge.

REQUIREMENT

For the tools such as charge hose, etc., use those manufactured exclusively for R410A.

Refrigerant amount to be added

For addition of the refrigerant, add refrigerant “R410A” referring to the attached Installation Manual of outdoor unit.
Be sure to use a scale to charge the refrigerant of specified amount.

REQUIREMENT

- Charging an excessive or too little amount of refrigerant causes a trouble of the compressor. Be sure to charge the refrigerant of specified amount.
- A personnel who charged the refrigerant should write down the pipe length and the added refrigerant amount in the nameplate attached to the service panel of the outdoor unit. It is necessary to troubleshoot the compressor and refrigeration cycle malfunction.

Open the valve fully

Open the valve of the outdoor unit fully. A 4mm-hexagonal wrench is required for opening the valve.
For details, refer to the Installation Manual attached to the outdoor unit.

Gas leak check

Check with a leak detector or soap water whether gas leaks or not, from the pipe connecting section or cap of the valve.

REQUIREMENT

Use a leak detector manufactured exclusively for HFC refrigerant (R410A, R134a, etc.).

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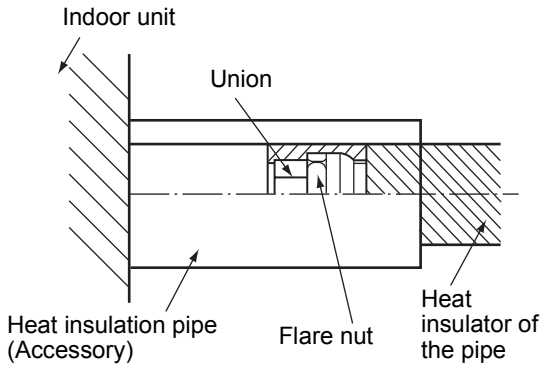
Thermal insulation process

Apply thermal insulation for the pipes separately at liquid side and gas side.
For the thermal insulation to the pipes at gas side, be sure to use the material with heat-resisting temperature 120°C or higher.
Using the attached thermal insulation material, apply the thermal insulation to the pipe connecting section of the indoor unit securely without gap.

REQUIREMENT

- Apply the thermal insulation to the pipe connecting section of the indoor unit securely up to the root without exposure of the pipe. (The pipe exposed to the outside causes water leak.)
- Wrap heat insulator with its slits facing up (ceiling side).



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8 ELECTRICAL WORK

⚠ WARNING

1. **Using the specified wires, ensure to connect the wires, and fix wires securely so that the external tension to the wires do not affect the connecting part of the terminals.**
   Incomplete connection or fixation may cause a fire, etc.
2. **Be sure to connect earth wire. (grounding work)**
   Incomplete grounding cause an electric shock. Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.
3. **Appliance shall be installed in accordance with national wiring regulations.**
   Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠ CAUTION

- This indoor unit has no power cord.
- If incorrect/incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Be sure to install an earth leakage breaker that is not tripped by shock waves.
  If an earth leakage breaker is not installed, an electric shock may be caused.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Use the power cord and Inter-connecting wire of specified thickness, type, and protective devices required.

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Never connect 220–240V power to the terminal blocks (Ⓐ, Ⓑ, etc.) for control wiring. (Otherwise, the system will fail.)
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe.
  The coating may melt resulting in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the cord clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

Remote controller wiring

2-core non polarity wire is used for the remote controller wiring.

How to wire

1. Connect the connecting wire to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit.
   H07 RN-F or 60245 IEC 66 (1.5 mm^2 or more)
2. Insulate the unsheathed redundant cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.

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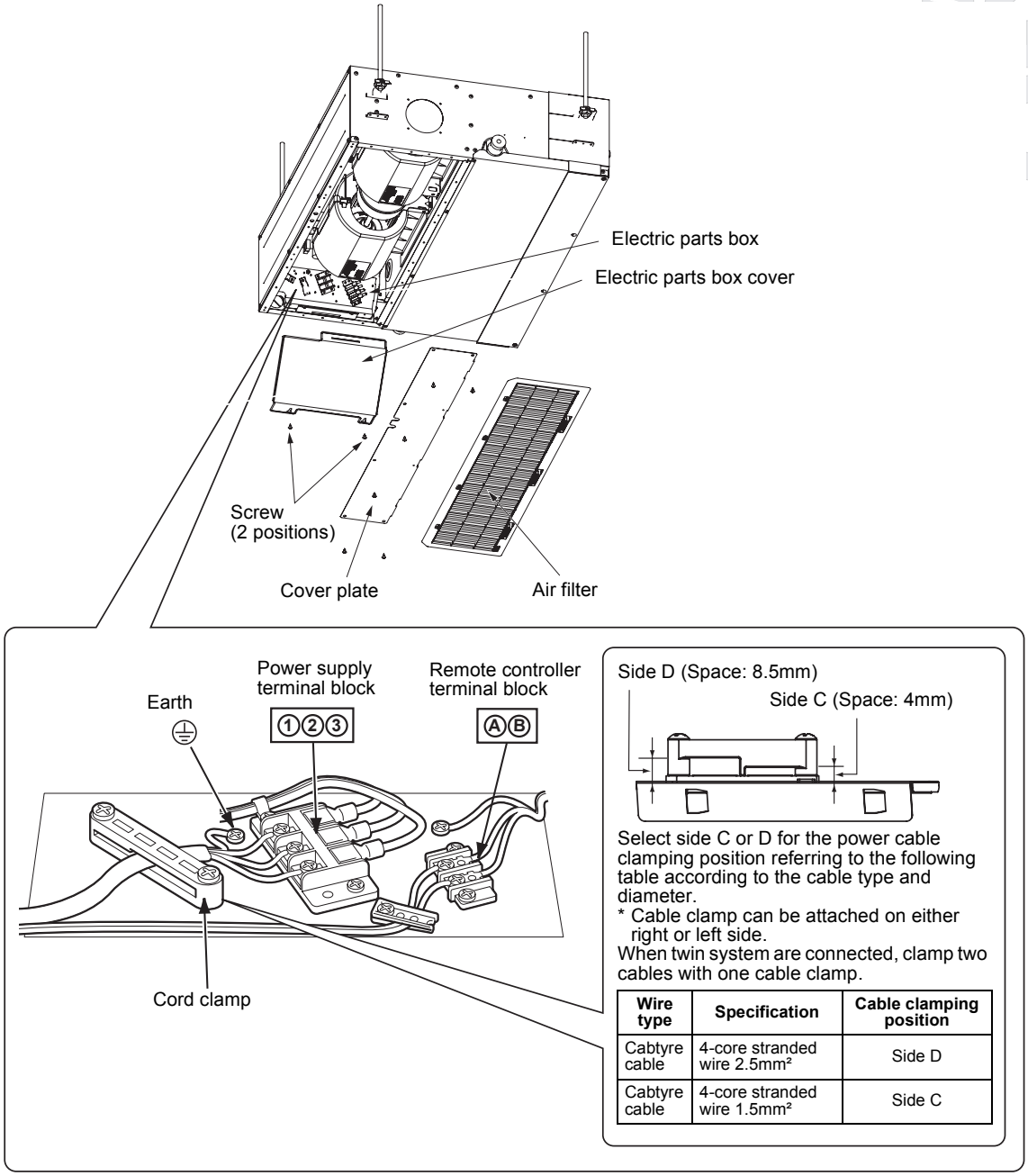
■ Wire connection

REQUIREMENT

- Be sure to connect the wires matching the terminal numbers. Incorrect connection causes a trouble.
- Be sure to pass the wires through the bushing of wiring connection port of the indoor unit.
- Keep a margin (Approx. 100mm) on a wire to hang down the electric parts box at servicing, etc.
- The low-voltage circuit is provided for the remote controller. (Do not connect the high-voltage circuit)

- Before remove the electric parts cover, remove the cover plate and air filter.
- Remove the cover of the electric parts box by taking off the mounting screws (2 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- Tighten the screws of the terminal block, and fix the wires with cord attached to the electric parts box. (Do not apply tension to the connecting section of the terminal block.)
- Be sure to set a loop for the connecting wire of the storing part of the indoor unit electric parts; otherwise the electric parts box cannot be drawn out in service time.
- Mount the cover of the electric parts box without pinching wires.



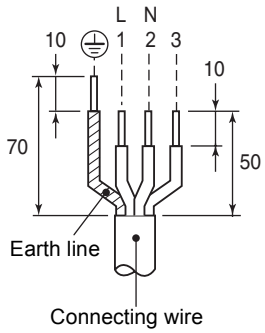
Select side C or D for the power cable clamping position referring to the following table according to the cable type and diameter.
* Cable clamp can be attached on either right or left side.
When twin system are connected, clamp two cables with one cable clamp.

Wire type	Specification	Cable clamping position
Cabtyre cable	4-core stranded wire 2.5mm²	Side D
Cabtyre cable	4-core stranded wire 1.5mm²	Side C

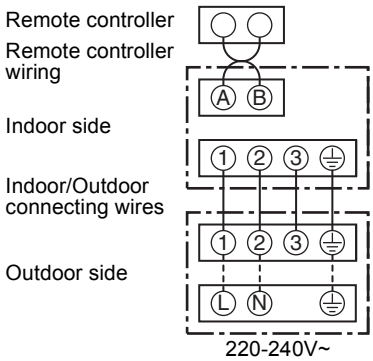
■ Wiring

1. Remove a screw and then remove cover of the electric parts box.
2. Strip wire ends (10 mm).
3. Match wire colors with terminal numbers on indoor and outdoor units' terminal blocks and firmly screw wires to the corresponding terminals.
4. Connect the ground wires to the corresponding terminals.
5. Fix the wire with cord clamp.
6. Fix cover of the parts box and the terminal block surely with the fixing screws.

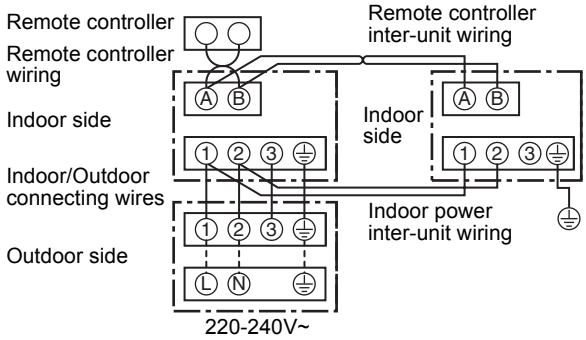
Make a loop on the wire for margin of the length so that the electric parts box can be taken out during servicing.



▼ Single system



▼ Synchronous twin system

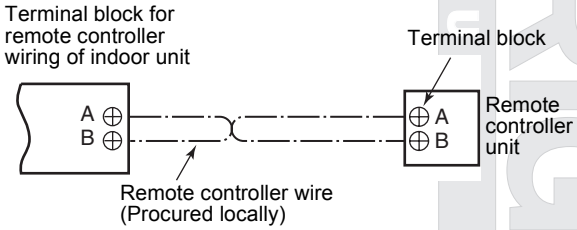


* For details of wiring/installation of the remote controller, refer to the Installation Manual enclosed to in the remote controller.

■ Remote Controller Wiring

- Strip off approx. 9mm the wire to be connected.
- Non polarity, 2 core wire is used for wiring of the remote controller. (0.5mm² to 2.0mm² wires)

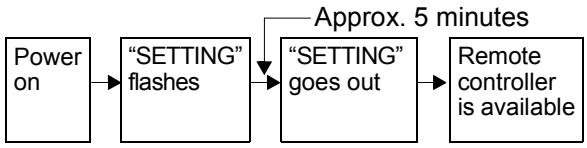
Wiring diagram



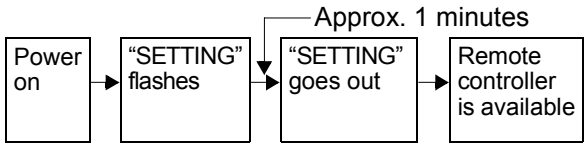
9 APPLICABLE CONTROLS

REQUIREMENT

- When you use this air conditioner for the first time, it takes approx. 5 minutes until the remote controller becomes available after power-on. This is normal.
  <When power is turned on for the first time after installation>
  It takes **approx. 5 minutes** until the remote controller becomes available.



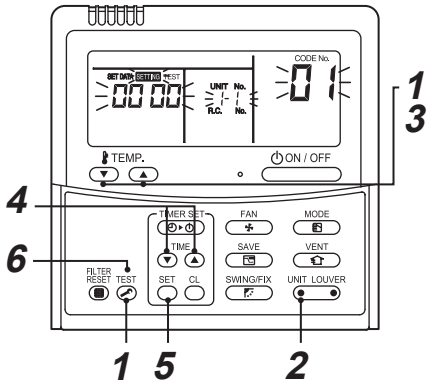
  <When power is turned on for the second (or later) time>
  It takes **approx. 1 minute** until the remote controller becomes available.



- Normal settings were made when the indoor unit was shipped from factory.
  Change the indoor unit settings as required.
- Use the wired remote controller to change the settings.
  * The settings cannot be changed using the wireless remote controller, sub remote controller, or remote-controllerless system (for central remote controller only). Therefore, install the wired remote controller to change the settings.

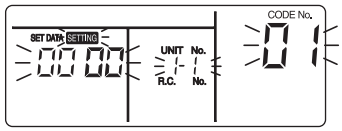
■ Changing of settings of for applicable controls

Basic procedure for changing settings
Change the settings while the air conditioner is not working.
(Be sure to stop the air conditioner before making settings.)



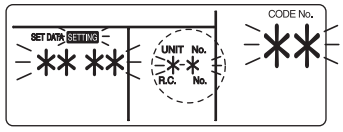
Procedure *1*
Push TEST button and temp. setup ▼ button simultaneously for at least 4 seconds.
After a while, the display flashes as shown in the figure.
Confirm that the CODE No. is [01].

- If the CODE No. is not [01], push TEST button to erase the display content, and repeat the procedure from the beginning.
  (No operation of the remote controller is accepted for a while after TEST button is pushed.)



(* Display content varies with the indoor unit model.)

Procedure *2*
Each time you push UNIT LOUVER button, indoor unit numbers in the control group change cyclically.
Select the indoor unit you want to change settings for.
The fan of the selected unit runs. You can confirm the indoor unit for which you want to change settings.



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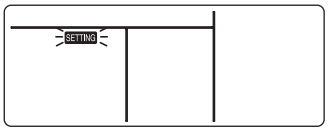
Procedure *3*
Using temp. setup ▼ / ▲ buttons, specify CODE No. [✱✱].

Procedure *4*
Using timer time ▼ / ▲ buttons, select SET DATA [✱✱✱].

Procedure *5*
Push SET button. When the display changes from flashing to lit, the setup is completed.

- To change settings of another indoor unit, repeat from Procedure ***2***.
- To change other settings of the selected indoor unit, repeat from Procedure ***3***.
  Use SET button to clear the settings.
  To make settings after SET button was pushed, repeat from Procedure ***2***.

Procedure *6*
When settings have been completed, push TEST button to determine the settings.
When TEST button is pushed, "SETTING" flashes and then the display content disappears and the air conditioner enters the normal stop mode.
(While "SETTING" is flashing, no operation of the remote controller is accepted.)



■ Setup of external static pressure

Be sure to set up a tap change based upon the resistance (external static pressure) of the duct to be connected.
To set up a tap change, follow to the basic operation procedure (***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- Specify [5d] to the item code in procedure ***3***.
- For the setup data of procedure ***4***, select a setup data of the external static pressure to be set up from the following table.

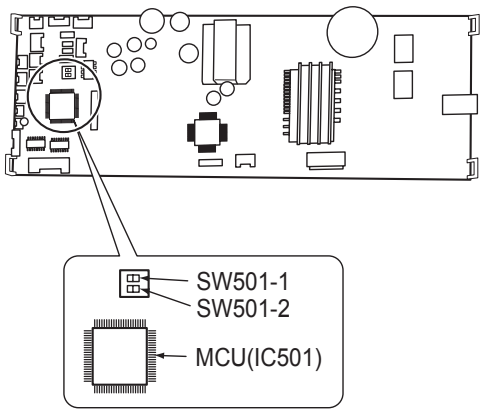
<Change on wired remote controller>

Setup data	External static pressure	
0000	10 Pa	Standard (At shipment)
0001	20 Pa	High static pressure 1
0003	35 Pa	High static pressure 2
0006	50 Pa	High static pressure 3

When wireless remote controller is used

Change the external static pressure setting with the DIP switch on the receiver section P.C. board.
For details, refer to the manual of the wireless remote controller kit. The settings can also be changed with the switch on the indoor microcomputer P.C. board.

* However, once the setting is changed, setting to 0001 or 0006 is possible but setting to 0000 requires a setting data change to 0000 using the wired remote controller (separately sold) with the normal switch setting (factory setting).



Setup data	SW501-1	SW501-2
0000 (Factory shipping)	OFF	OFF
0001	ON	OFF
0003	OFF	ON
0006	ON	ON

To restore the factory settings

To return the DIP switch settings to the factory settings, set SW501-1 and SW501-2 to OFF, connect a separately sold wired remote controller, and then set the data of CODE No. [5d] to "**0000**" in "Setup of external static pressure" on this page.

■ Change of lighting time of filter sign

According to the installation condition, the lighting time of the filter sign (Notification of filter cleaning) can be changed.
Follow to the basic operation procedure
(***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- For the CODE No. in Procedure ***3***, specify [01].
- For the [Set data] in Procedure ***4***, select the setup data of filter sign lighting time from the following table.

Setup data	Filter sign lighting time
0000	None
0001	150H
0002	2500H (At shipment from factory)
0003	5000H
0004	10000H

■ To secure better effect of heating

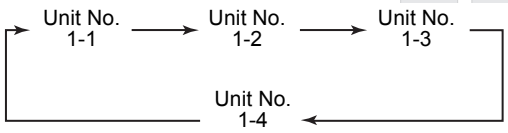
When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised. Also use a circulator, etc. to circulate heat air near the ceiling.
Follow to the basic operation procedure
(***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

- For the CODE No. in Procedure ***3***, specify [06].
- For the set data in Procedure ***4***, select the setup data of shift value of detection temperature to be set up from the table below.

Setup data	Detection temp shift value
0000	No shift
0001	+1°C
0002	+2°C (At shipment from factory)
0003	+3°C
0004	+4°C
0005	+5°C
0006	+6°C

■ How to set up power saving mode

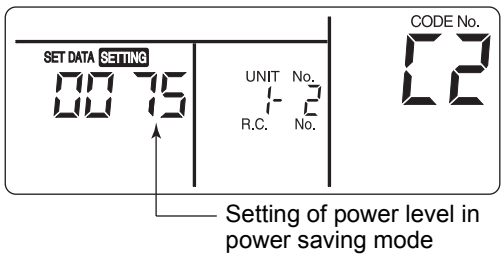
1. Push SAVE button for at least four seconds when the air conditioner is not working.
   SETTING flashes.
   Indicates CODE No. “C2.”
2. Select an indoor unit to be set by pushing UNIT LOUVER (left side of the button).
   Each time you push the button, unit numbers change as follows:



   The fan of the selected unit runs.
3. Adjust the power save setting by pushing TIME ▼ ▲ buttons.
   Each push of the button changes the power level by 1% within the range from 100% to 50%.

* The factory setting is 75%.

- This indication may not be true for types other than 4-series outdoor unit.



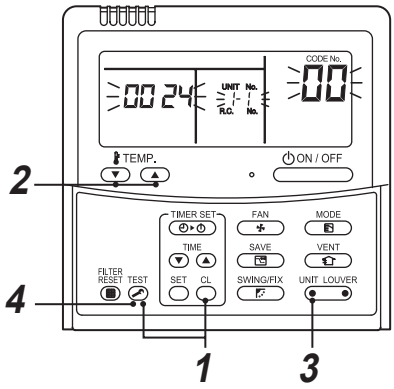
4. Determine the setting by pushing SET button.
5. Push TEST button to complete the setting.

EN

■ Remote controller switch monitoring function

This function is available to call the service monitor mode from the remote controller during a test run to acquire temperatures of sensors of the remote controller, indoor unit, and outdoor unit.

1. Push CL and TEST buttons simultaneously for at least 4 seconds to call the service monitor mode. The service monitor indicator lights up and the header indoor unit number is displayed first. CODE No. 00 is also displayed.
2. Pushing TEMP. ▼ ▲ buttons, select the number of sensor, etc. (CODE No.) to be monitored. (See the following table.)
3. Pushing UNIT LOUVER (left side of the button), select an indoor unit to be monitored. The sensor temperatures of indoor units and their outdoor unit in the control group are displayed.
4. Push TEST button to return to the normal display.



Indoor unit data	
CODE No.	**Data name**
01	Room temperature (remote controller)
02	Indoor unit intake air temperature (TA)
03	Indoor unit heat exchanger (coil) temperature (TCJ)
04	Indoor unit heat exchanger (coil) temperature (TC)
F3	Indoor unit fan cumulative operating hours (x1 h)

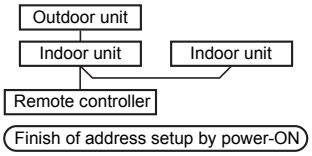
Outdoor unit data	
CODE No.	**Data name**
60	Outdoor unit heat exchanger (coil) temperature (TE)
61	Outside air temperature (TO)
62	Compressor discharge temperature (TD)
63	Compressor suction temperature (TS)
64	—
65	Heatsink temperature (THS)
6A	Operating current (x1/10)
F1	Compressor cumulative operating hours (x100h)

■ Group control

Simultaneous twin system

A combination with an outdoor unit allows simultaneous ON/OFF operation of two indoor units for the twin system.

▼ Twin system



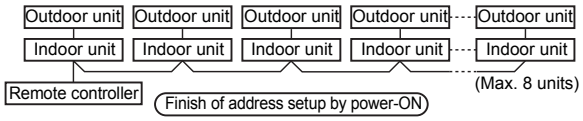
- For wiring procedure and wiring method, follow to the “Electric work” in this manual.
- When the power supply has been turned on, the automatic address setup starts and which indicates that address is being set up flashes on the display part.
  During setup of automatic address, the remote controller operation is not accepted.

Required time up to the finish of automatic addressing is approx. 5 minutes.

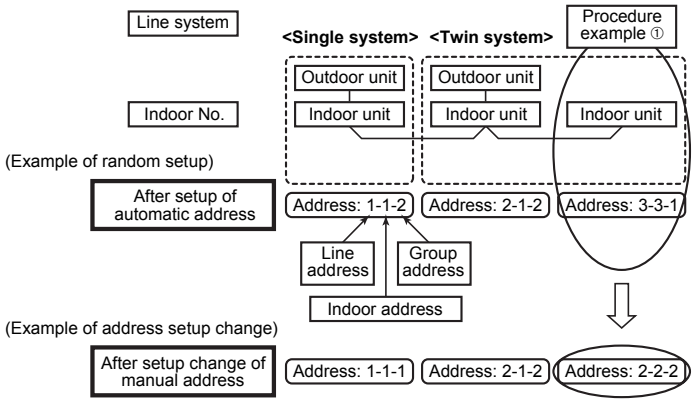
In case of group control for system of multiple units

One remote controller can control maximum 8 indoor units as a group.

▼ In case of group control in single system



(Example) Group control for complex system



The above address is set by the automatic addressing when the power is turned on. However, line addresses and indoor addresses are set randomly. For this reason, change the setting to match line addresses with indoor addresses.

- For wiring procedure and wiring method of the individual line (Identical refrigerant line) system, follow to “Electric work”.
- Wiring between lines is performed in the following procedure.
  Connect the terminal block (A/B) of the indoor unit connected with a remote controller to the terminal blocks (A/B) of the indoor units of other indoor units by wiring the inter-unit wire of the remote controller.
- When the power supply has been turned on, the automatic address setup starts and which indicates that address is being set up flashes on the display part. During setup of automatic address, the remote controller operation is not accepted.

Required time up to the finish of automatic addressing is approx. 5 minutes.

NOTE

In some cases, it is necessary to change the address manually after setup of the automatic address according to the system configuration of the group control.

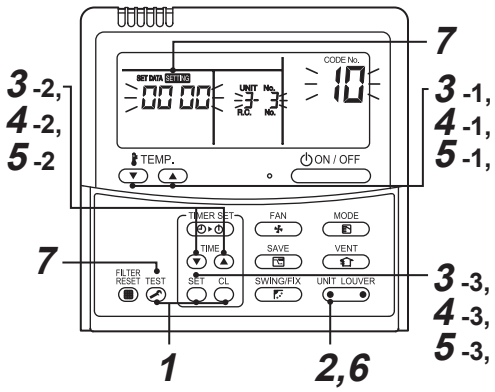
- The above mentioned system configuration is a case when complex systems in which systems of the multiple twin unit is controlled as a group by a remote controller.

EN

Procedure example ①

Manual address setup procedure

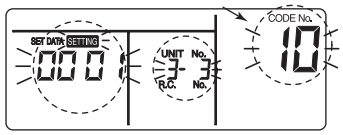
While the operation stops, change the setup. (Be sure to stop the operation of the unit.)



Procedure *1*

Push simultaneously SET + CL + TEST buttons for 4 seconds or more. After a while, the display part flashes as shown below. Check the displayed CODE No. is [**10**].

- When the CODE No. is other than [**10**], push TEST button to erase the display and repeat procedure from the first step.
  (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.)
  (For a group control, No. of the firstly displayed indoor unit becomes the header unit.)



(* Display changes according to the model No. of indoor unit.)

Procedure *2*

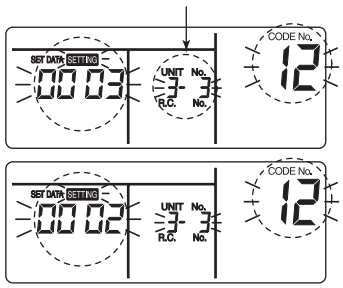
Every pushing UNIT LOUVER button, the indoor unit No. in the group control is displayed in order. Select the indoor unit of which setup is changed.

In this time, the position of the indoor unit of which setup is changed can be confirmed because fan of the selected indoor unit operate.

Procedure *3*

1. Using temp. setup ▼ / ▲ buttons, specify CODE No. [**12**].
   (CODE No. [**12**]: Line address)
2. Using timer time ▼ / ▲ buttons, change the line address from [**3**] to [**2**].
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

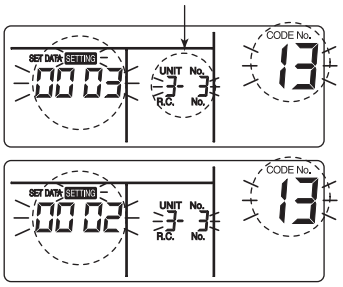
Indoor unit No. before setup change is displayed.



Procedure *4*

1. Using temp. setup ▼ / ▲ buttons, specify CODE No. [**13**].
   (CODE No. [**13**]: Indoor address)
2. Using timer time ▼ / ▲ buttons, change the indoor address from [**3**] to [**2**].
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

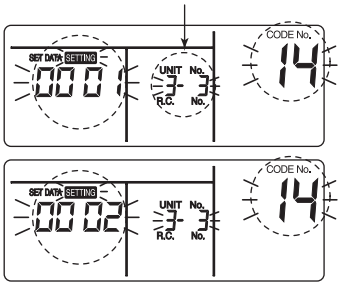
Indoor unit No. before setup change is displayed.



Procedure *5*

1. Using temp. setup ▼ / ▲ buttons, specify CODE No. [**14**].
   (CODE No. [**14**]: Group address)
2. Using timer time ▼ / ▲ buttons, change the setup data from [**0001**] to [**0002**].
   (Setup data [Header unit: **0001**] [Follower unit: **0002**])
3. Push SET button.
   In this time, the setup finishes when the display changes from flashing to lighting.

Indoor unit No. before setup change is displayed.



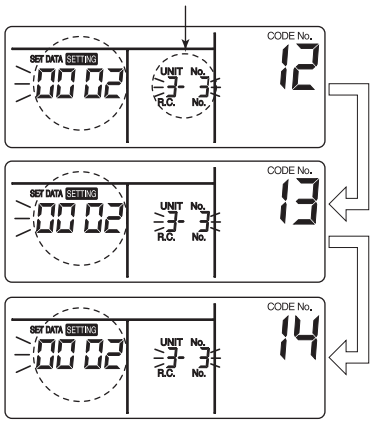
Procedure *6*

If there is other indoor unit to be changed, repeat procedure ***2*** to ***5*** to change the setup.
When the above setup has finished, push UNIT LOUVER to select the indoor unit No. before change of setup, specify CODE No. [**12**], [**13**], [**14**] in order with temp. setup ▼ / ▲ buttons, and then check the changed contents.

Address change check Before change:
[**3-3-1**] → After change: [**2-2-2**]

Pushing CL button clears the contents of which setup was changed.
(In this case, procedure from ***2*** is repeated.)

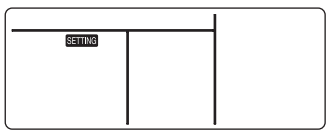
Indoor unit No. before setup change is displayed.



Procedure *7*

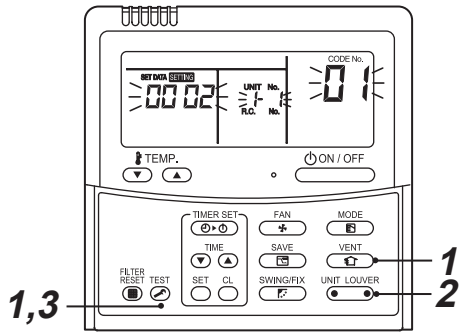
After check of the changed contents, push TEST button. (Setup is determined.) When pushing TEST button, the display disappears and the status becomes the usual stop status. (When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)

* If the operation from the remote controller is not accepted even 1 minute or more passed after pushing TEST button, it is considered that the address setup is incorrect.
In this case, the automatic address must be again set up.
Therefore repeat procedure of the setup change from the Procedure ***1***.



To recognize the position of the corresponding indoor unit though the indoor unit No. is known

Check the position during operation stop.
(Be sure to stop operation of the set.)



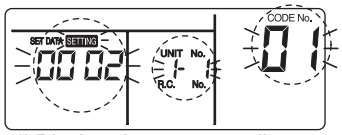
Procedure *1*

Push simultaneously TEST + VENT buttons for 4 seconds or more.
After a while, the display part flashes and the display appears as shown below.
In this time, the position can be checked because fan of the indoor unit operate.

- For the group control, the indoor unit No. is displayed as [ALL] and fans of all the indoor units in the group control operate.

Check the displayed CODE No. is [**01**].

- When the CODE No. is other than [**01**], push TEST button to erase the display and repeat procedure from the first step.
  (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.)



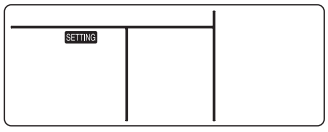
(* Display changes according to the model No. of indoor unit.)

Procedure *2*

In the group control, every pushing UNIT LOUVER button, the indoor unit No. in the group control is displayed in order.
In this time, the position of the indoor unit can be confirmed because only fan of the selected indoor unit operate.
(For a group control, No. of the firstly displayed indoor unit becomes the header unit.)

Procedure *3*

After confirmation, push TEST button to return the mode to the usual mode.
When pushing TEST button, the display disappears and the status becomes the usual stop status.
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)



EN

■ How to set up 8°C Operation (SM40 and SM45 types only)

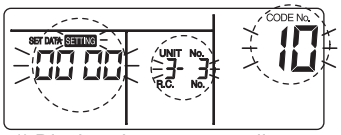
Preheating operation can be set for cold regions where room temperature drops to below zero.

Procedure *1*

Push simultaneously SET + CL + TEST buttons for 4 seconds or more when the air conditioner is not working.

After a while, the display part flashes as shown below. Check the Displayed CODE No. is [**10**].

- When the CODE No. is other than [**10**], push TEST button to erase the display and repeat procedure from the first step.
  (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.)



(* Display changes according to the model No. of indoor unit.)

Procedure *2*

Every pushing UNIT LOUVER button, the indoor unit No. in the group control is displayed in order. Select the indoor unit of which setup is changed. In this time, the position of the indoor unit of which setup is changed can be confirmed because fan of the selected indoor unit operate.

Procedure *3*

Using temp. setup ▼ / ▲ buttons, specify CODE No. [**d1**].

Procedure *4*

Using timer time ▼ / ▲ buttons, select SET DATA [**0001**].

Setup data	8°C Operation setting
0000	None (Factory Shipping)
0001	8°C Operation setting

Procedure *5*

Push SET button.

In this time, the setup finishes when the display changes from flashing to lighting.

Procedure *6*

Push TEST button.(Setup is determined.)

When pushing TEST button, the display disappears and the status

Becomes the usual stop status. (When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)

- This function is not available for SM56 that has 2-series outdoor unit.

10 TEST RUN

■ Before test run

- Before turning on the power supply, carry out the following procedure.
  1) Using 500V-megger, check that resistance of 1MΩ or more exists between the terminal block 1 to 3 and the earth (grounding).
     If resistance of less than 1MΩ is detected, do not run the unit.
  2) Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more befor operating.

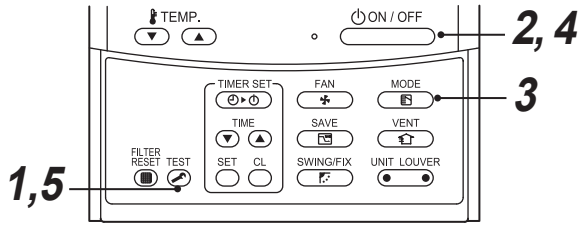
■ How to execute a test run

Using the remote controller, operate the unit as usual.
For the procedure of the operation, refer to the attached Owner's Manual.
A forced test run can be executed in the following procedure even if the operation stops by thermo.-OFF.
In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

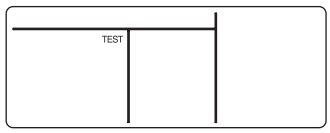
⚠ CAUTION

- Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.

In case of wired remote controller

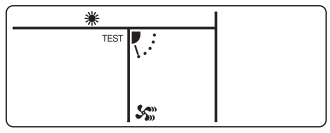


Procedure *1*
Keep TEST button pushed for 4 seconds or more.
[TEST] is displayed on the display part and the selection of mode in the test mode is permitted.



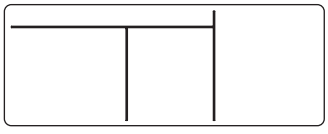
Procedure *2*
Push ON / OFF button.

Procedure *3*
Using MODE button, select the operation mode, [COOL] or [HEAT].
- Do not run the air conditioner in a mode other than [COOL] or [HEAT].
- The temperature controlling function does not work during test run.
- The detection of error is performed as usual.



Procedure *4*
After the test run, push ON / OFF button to stop a test run.
(Display part is same as procedure 1.)

Procedure *5*
Push TEST check button to cancel (release from) the test run mode.
([TEST] disappears on the display and the status returns to a normal.)



EN

In case of wireless remote controller

Procedure *1*

Turn on the power of the air conditioner.
When power is turned on for the first time after installation, it takes approx. 5 minutes until the remote controller becomes available. In the case of subsequent power-on, it takes approx. 1 minute until the remote controller becomes available. Execute a test run after the predetermined time has passed.

Procedure *2*

Push “ON/OFF” button on the remote controller, select [COOL] or [HEAT] with “MODE” button, and then select [HIGH] with “FAN” button.

Procedure *3*

Cooling test run	Heating test run
Set the temperature to **18°C** with the temp. setup buttons.	Set the temperature to **30°C** with the temp. setup buttons.

Procedure *4*

Cooling test run	Heating test run
After confirming a signal receiving sound “beep” immediately set the temperature to **19°C** with the temp. setup buttons.	After confirming a signal receiving sound “beep” immediately set the temperature to **29°C** with the temp. setup buttons.

Procedure *5*

Cooling test run	Heating test run
After confirming a signal receiving sound “beep” immediately set the temperature to **18°C** with the temp. setup buttons.	After confirming a signal receiving sound “beep” immediately set the temperature to **30°C** with the temp. setup buttons.

Procedure *6*

Repeat procedures ***4*** → ***5*** → ***4*** → ***5***.
Indicators “Operation” (green), “Timer” (green), and “Ready” (orange) in the wireless receiver section flash in approx. 10 seconds, and the air conditioner starts operation. If any of these indicators does not flash, repeat procedures ***2*** to ***5***.

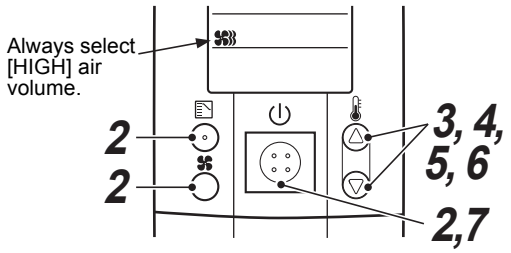
Procedure *7*

Upon completion of the test run, push “ON/OFF” button to stop operation.

<Overview of test run operations using the wireless remote controller>

▼ Cooling test run:
ON/OFF → 18°C → 19°C → 18°C → 19°C → 18°C → 19°C → 18°C → (test run) → ON/OFF

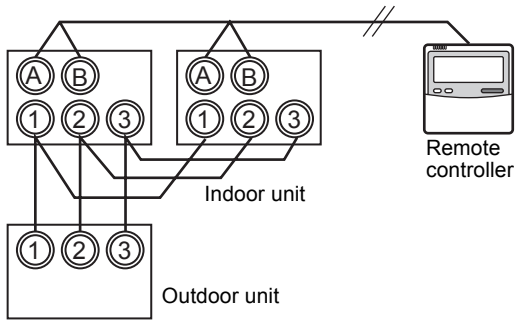
▼ Heating test run:
ON/OFF → 30°C → 29°C → 30°C → 29°C → 30°C → 29°C → 30°C → (test run) → ON/OFF



- **Measures when check code “E18” appears in the concurrent twin system (one outdoor unit)**
  E18…Displayed when incorrect connections ①-①, ②-②, and ③-③ are made between indoor units.

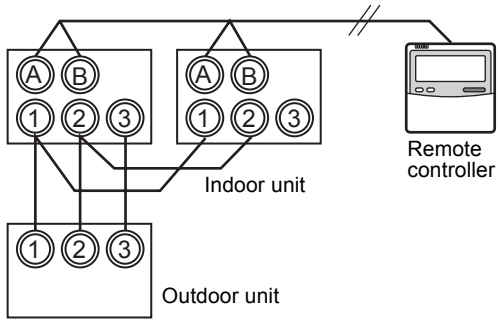
Measures
Reconnect cables correctly between indoor units.

Incorrect connection



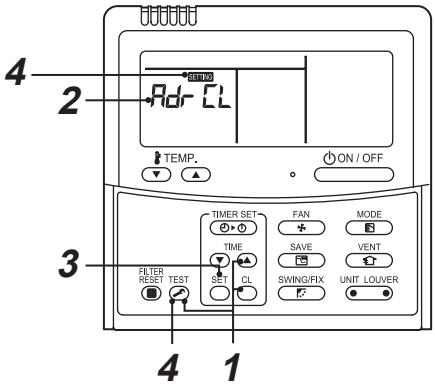
Disconnect the connection ③-③ between indoor units.

Correct connection

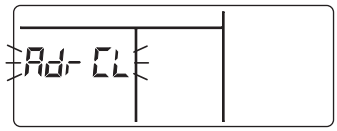


Set the address again.

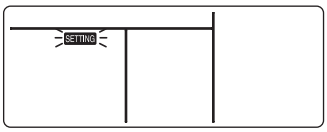
1. Push TEST, CL, and TIME ▲ buttons simultaneously for at least 4 seconds.



2. "Adr CL" flashes on the display as shown in the following figure.



3. Push SET button. "Adr CL" changes from flashing to lighting.
4. Push TEST button. "Adr CL" disappears and "SETTING" flashes. (It takes 5 minutes.)



5. When "SETTING" disappears, re-setting is completed and the air conditioner enter the normal operation standby mode.

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11 MAINTENANCE

For maintenance, be sure to turn off the main power switch.

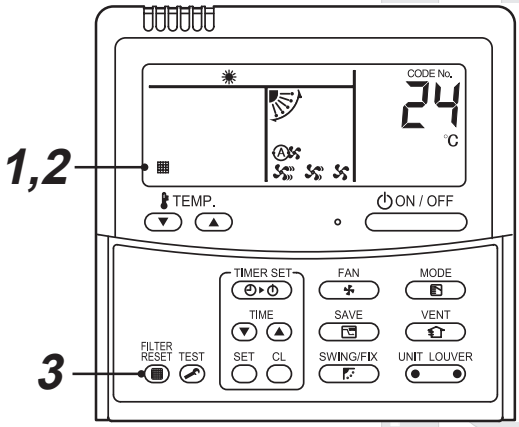
⚠ CAUTION

Do not handle the buttons with wet hands; otherwise an electric shock may be caused.

<Daily maintenance>

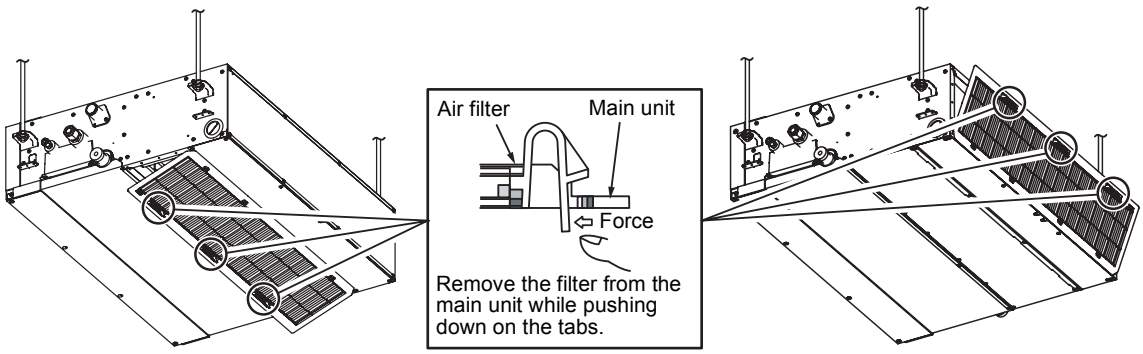
Cleaning of air filter

1. If ▦ is displayed on the remote controller, contact to service on maintenance professional to cleaning the air filter.
2. Clogging of the air filter decreases cooling/heating efficiency.
3. After cleaning, push FILTER RESET.
   ▦ display disappears.

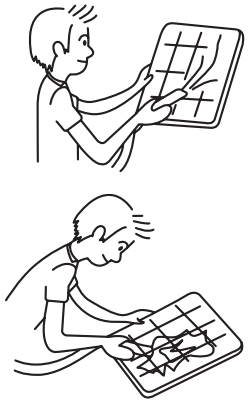


<Air filter cleaning method>

1. Take out the air filter.
   - Push the tabs (Forward direction as shown in the figure) of the air filter, and then pull out it to take out the air filter.



2. Cleaning with water or vacuum cleaner
   - If dirt is heavy, clean the air filter by tepid water with neutral detergent or water.
   - After cleaning with water, dry the air filter sufficiently in a shade place.
3. Mount the air filter.
   - Attach the filter to the main unit while pushing the tabs (Forward direction as shown in the figure).
4. Push FILTER RESET.
   - ▦ display disappears.



NOTE

When connecting a return air ducting to the unit, the cleaning method of the air filter differs according to the construction of duct end. Please ask the constructor for construction of air duct.

⚠ CAUTION

- Do not start the air conditioner while leaving air filter removed.
- Push the filter reset button. (▦ indication will be turn off.)

ANNUAL MAINTENANCE

- For environmental conservation, it is strongly recommended that the indoor and outdoor units of the air conditioner in use be cleaned and maintained regularly to ensure efficient operation of the air conditioner.
  When the air conditioner is operated for a long time, periodic maintenance (once a year) is recommended.
  Furthermore, regularly check the outdoor unit for rust and scratches, and remove them or apply rustproof treatment, if necessary.
  As a general rule, when an indoor unit is operated for 8 hours or more daily, clean the indoor unit and outdoor unit at least once every 3 months. Ask a professional for this cleaning/maintenance work.
  Such maintenance can extend the life of the product though it involves the owner's expense.
  Failure to clean the indoor and outdoor units regularly will result in poor performance, freezing, water leakage, and even compressor failure.
- This product incorporates a drain pump.
  If it is used in a place full of dust or oil mist, the pump will be clogged and proper drainage is disabled.
  Clean the drain pump periodically. For how to clean the drain pump, contact the dealer.

Maintenance List

Part	Unit	Check (visual/auditory)	Maintenance
Heat exchanger	Indoor/outdoor	• Dust/dirt clogging, scratches	• Wash the heat exchanger when it is clogged.
Fan motor	Indoor/outdoor	• Sound	• Take appropriate measures when abnormal sound is generated.
Filter	Indoor	• Dust/dirt, breakage	• Wash the filter with water when it is contaminated. • Replace it when it is damaged.
Fan	Indoor	• Vibration, balance • Dust/dirt, appearance	• Replace the fan when vibration or balance is terrible. • Brush or wash the fan when it is contaminated.
Air inlet/outlet grilles	Indoor/outdoor	• Dust/dirt, scratches	• Fix or replace them when they are deformed or damaged.
Drain pan	Indoor	• Dust/dirt clogging, drain contamination	• Clean the drain pan and check the downward slope for smooth drainage.
Ornamental panel, louvers	Indoor	• Dust/dirt, scratches	• Wash them when they are contaminated or apply repair coating.
Exterior	Outdoor	• Rust, peeling of insulator • Peeling/lift of coat	• Apply repair coating.

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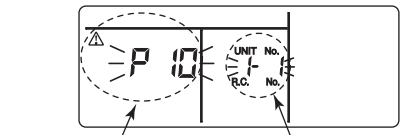
12 TROUBLE SHOOTING

■ Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.
The check code is only displayed during the operation.
If the display disappears, operate the air conditioner according to the following "Confirmation of error history" for confirmation.

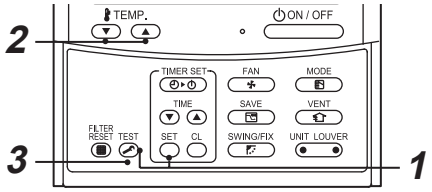


Check code

Indoor unit No. in which an error occurred

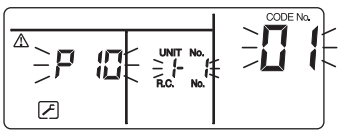
■ Confirmation of error history

When a trouble occurred on the air conditioner, the trouble history can be confirmed with the following procedure. (The trouble history is stored in memory up to 4 troubles.)
The history can be confirmed from both operating status and stop status.



Procedure *1*
When pushing SET and TEST buttons at the same time for 4 seconds or more, the following display appears.
If [Service check] is displayed, the mode enters in the trouble history mode.

- [**01** : Order of trouble history] is displayed in CODE No..
- [Check code] is displayed in CHECK.
- [Indoor unit address in which an error occurred] is displayed in Unit No..



Procedure *2*
Every pushing of TEMP. button used to set temperature, the trouble history stored in memory is displayed in order.
The numbers in CODE No. indicate CODE No.
[**01**] (latest) → [**04**] (oldest).

REQUIREMENT

Do not push CL button because all the trouble history of the indoor unit will be deleted.

Procedure *3*
After confirmation, push TEST button to return to the usual display.

■ Check codes and parts to be checked

Wired remote controller display	Wireless remote controller Sensor block display of receiving unit				Main defective parts	Judging device	Parts to be checked / error description	Air conditioner status
Indication	Operation GR	Timer GR	Ready OR	Flashing				
E01	◎	●	●		No header remote controller	Remote controller	Incorrect remote controller setting --- The header remote controller has not been set (including two remote controllers).	*
					Remote controller communication error		No signal can be received from the indoor unit.	
E02	◎	●	●		Remote controller transmission error	Remote controller	Indoor/outdoor connecting wires, indoor P.C. board, remote controller --- No signal can be sent to the indoor unit.	*
E03	◎	●	●		Indoor unit-remote controller regular communication error	Indoor	Remote controller, network adapter, indoor P.C. board --- No data is received from the remote controller or network adapter.	Auto-reset
E04	●	●	◎		Indoor unit-outdoor unit serial communication error	Indoor	Indoor/outdoor connecting wires, indoor P.C. board, outdoor P.C. board --- Serial communication error between indoor unit and outdoor unit	Auto-reset
					IPDU-CDB communication error			
E08	◎	●	●		Duplicated indoor addresses ★	Indoor	Indoor address setting error --- The same address as the self-address was detected.	Auto-reset
E09	◎	●	●		Duplicated header remote controllers	Remote controller	Remote controller address setting error --- Two remote controllers are set as header in the double-remote controller control.	*
							(* The header indoor unit stops raising alarm and follower indoor units continue to operate.)	
E10	◎	●	●		CPU-CPU communication error	Indoor	Indoor P.C. board --- Communication error between main MCU and motor microcomputer MCU	Auto-reset
E18	◎	●	●		Header indoor unit-indoor follower unit regular communication error	Indoor	Indoor P.C. board --- Regular communication is not possible between header and follower indoor units or between twin header (main) and follower (sub) units.	Auto-reset
E31	●	●	◎		IPDU communication error	Outdoor	Communication error between IPDU and CDB	Entire stop
F01	◎	◎	●	ALT	Indoor unit heat exchanger sensor (TCJ) error	Indoor	Heat exchanger sensor (TCJ) , indoor P.C. board --- Open-circuit or short-circuit of the heat exchanger sensor (TCJ) was detected.	Auto-reset
F02	◎	◎	●	ALT	Indoor unit heat exchanger sensor (TC) error	Indoor	Heat exchanger sensor (TC), indoor P.C. board --- Open-circuit or short-circuit of the heat exchanger sensor (TC) was detected.	Auto-reset
F04	◎	◎	○	ALT	Outdoor unit discharge temp. sensor (TD) error	Outdoor	Outdoor temp. sensor (TD), outdoor P.C. board --- Open-circuit or short-circuit of the discharge temp. sensor was detected.	Entire stop
F06	◎	◎	○	ALT	Outdoor unit temp. sensor (TE/TS) error	Outdoor	Outdoor temp. sensors (TE/TS), outdoor P.C. board --- Open-circuit or short-circuit of the heat exchanger temp. sensor was detected.	Entire stop
F07	◎	◎	○	ALT	TL sensor error	Outdoor	TL sensor may be displaced, disconnected or short-circuited.	Entire stop
F08	◎	◎	○	ALT	Outdoor unit outside air temp. sensor error	Outdoor	Outdoor temp. sensor (TO), outdoor P.C. board --- Open-circuit or short-circuit of the outdoor air temp. sensor was detected.	Operation continued
F10	◎	◎	●	ALT	Indoor unit room temp. sensor (TA) error	Indoor	Room temp. sensor (TA), indoor P.C. board --- Open-circuit or short-circuit of the room temp. sensor (TA) was detected.	Auto-reset
F12	◎	◎	○	ALT	TS (1) sensor error	Outdoor	TS (1) sensor may be displaced, disconnected or short-circuited.	Entire stop
F13	◎	◎	○	ALT	Heat sink sensor error	Outdoor	Abnormal temperature was detected by the temp. sensor of the IGBT heat sink.	Entire stop
F15	◎	◎	○	ALT	Temp. sensor connection error	Outdoor	Temp. sensor (TE/TS) may be connected incorrectly.	Entire stop
F29	◎	◎	●	SIM	Indoor unit, other P.C. board error	Indoor	Indoor P.C. board --- EEPROM error	Auto-reset

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F31	◎ ◎ ○	SIM	Outdoor unit P.C. board	Outdoor	Outdoor P.C. board ---- In the case of EEPROM error.	Entire stop
H01	● ◎ ●		Outdoor unit compressor breakdown	Outdoor	Current detect circuit, power voltage --- Minimum frequency was reached in the current releasing control or short-circuit current (Idc) after direct excitation was detected	Entire stop
H02	● ◎ ●		Outdoor unit compressor lock	Outdoor	Compressor circuit --- Compressor lock was detected.	Entire stop
H03	● ◎ ●		Outdoor unit current detect circuit error	Outdoor	Current detect circuit, outdoor unit P.C. board --- Abnormal current was detected in AC-CT or a phase loss was detected.	Entire stop
H04	● ◎ ●		Case thermostat operation (1)	Outdoor	Malfunction of the case thermostat	Entire stop
H06	● ◎ ●		Outdoor unit low-pressure system error	Outdoor	Current, high-pressure switch circuit, outdoor P.C. board --- Ps pressure sensor error was detected or low-pressure protective operation was activated.	Entire stop
L03	◎ ● ◎	SIM	Duplicated header indoor units ★	Indoor	Indoor address setting error --- There are two or more header units in the group.	Entire stop
L07	◎ ● ◎	SIM	Group line in individual indoor unit ★	Indoor	Indoor address setting error --- There is at least one group-connected indoor unit among individual indoor units.	Entire stop
L08	◎ ● ◎	SIM	Indoor group address not set ★	Indoor	Indoor address setting error --- Indoor address group has not been set.	Entire stop
L09	◎ ● ◎	SIM	Indoor power level not set	Indoor	Indoor power level has not been set.	Entire stop
L10	◎ ○ ◎	SIM	Outdoor unit P.C. board	Outdoor	In the case of outdoor P.C. board jumper wire (for service) setting error	Entire stop
L20	◎ ○ ◎	SIM	LAN communication error	Network adapter central control	Address setting, central control remote controller, network adapter --- Duplication of address in central control communication	Auto-reset
L29	◎ ○ ◎	SIM	Other outdoor unit error	Outdoor	Other outdoor unit error	Entire stop
					1) Communication error between IPDU MCU and CDB MCU	Entire stop
					2) Abnormal temperature was detected by the heat sink temp. sensor in IGBT.	
L30	◎ ○ ◎	SIM	Abnormal external input into indoor unit (interlock)	Indoor	External devices, outdoor unit P.C. board --- Abnormal stop due to incorrect external input into CN80	Entire stop
L31	◎ ○ ◎	SIM	Phase sequence error, etc.	Outdoor	Power supply phase sequence, outdoor unit P.C. board --- Abnormal phase sequence of the 3-phase power supply	Operation continued (thermostat OFF)
P01	● ◎ ◎	ALT	Indoor unit fan error	Indoor	Indoor fan motor, indoor P.C. board --- Indoor AC fan error (fan motor thermal relay activated) was detected.	Entire stop
P03	◎ ● ◎	ALT	Outdoor unit discharge temp. error	Outdoor	An error was detected in the discharge temp. releasing control.	Entire stop
P04	◎ ● ◎	ALT	Outdoor unit high-pressure system error	Outdoor	High-pressure switch --- The IOL was activated or an error was detected in the high-pressure releasing control using the TE.	Entire stop
P05	◎ ● ◎	ALT	Open phase detected	Outdoor	The power cable may be connected incorrectly. Check open phase and voltages of the power supply.	Entire stop
P07	◎ ● ◎	ALT	Heat sink overheat	Outdoor	Abnormal temperature was detected by the temp. sensor of the IGBT heat sink.	Entire stop
P10	● ◎ ◎	ALT	Indoor unit water overflow detected	Indoor	Drain pipe, clogging of drainage, float switch circuit, indoor P.C. board --- Drainage is out of order or the float switch was activated.	Entire stop
P15	◎ ● ◎	ALT	Gas leakage detected	Outdoor	There may be gas leakage from the pipe or connecting part. Check for gas leakage.	Entire stop
P19	◎ ● ◎	ALT	4-way valve error	Outdoor (Indoor)	4-way valve, indoor temp. sensors (TC/TCJ) --- An error was detected due to temperature drop of the indoor unit heat exchanger sensor when heating.	Auto-reset (Auto-reset)
P20	◎ ● ◎	ALT	High-pressure protective operation	Outdoor	High-pressure protection	Entire stop
P22	◎ ● ◎	ALT	Outdoor unit fan error	Outdoor	Outdoor unit fan motor, outdoor unit P.C. board --- An error (overcurrent, locking, etc.) was detected in the outdoor unit fan drive circuit.	Entire stop

P26	◎ ● ◎	ALT	Outdoor unit inverter Idc activated	Outdoor	IGBT, outdoor unit P.C. board, inverter wiring, compressor --- Short-circuit protection for compressor drive circuit devices (G-Tr/IGBT) was activated.	Entire stop
P29	◎ ● ◎	ALT	Outdoor unit position error	Outdoor	Outdoor unit P.C. board, high-pressure switch --- Compressor motor position error was detected.	Entire stop
P31	◎ ● ◎	ALT	Other indoor unit error	Indoor	Another indoor unit in the group is raising an alarm.	Entire stop
					E03/L07/L03/L08 alarm check locations and error description	Auto-reset

◯ : Lighting ◎ : Flashing ● : OFF ★ : The air conditioner automatically enters the auto-address setting mode.
ALT: When two LEDs are flashing, they flash alternately. SIM: When two LEDs are flashing, they flash in synchronization.
Receiving unit display OR: Orange GR: Green

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